NON-PUBLIC?: N
ACCESSION #: 9401260276
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Cooper Nuclear Station PAGE: 1 OF 03

DOCKET NUMBER: 05000298

TITLE: Unplanned Automatic Reactor Scram and ESF Actuations Due To A Feedwater Controller Failure
EVENT DATE: 12/14/93 LER #: 93-038-00 REPORT DATE: 01/13/94

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Donald L. Reeves, Jr. TELEPHONE: (402) 825-3811

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: JB COMPONENT: SC MANUFACTURER: G080
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On December 14, 1993, at 1:34 am, with the plant in operation at full power, an automatic reactor scram occurred due to low reactor vessel water level. The cause of the low water level was determined to be a failure of the Reactor Feedwater Pump (RFP) master controller. Upon receipt of annunciators associated with the feedwater system, reactor power was lowered by reducing the speed of the Reactor Recirculation (RR) Pumps. As water level continued to decrease, the B RR Pump was tripped in an effort to reduce power more rapidly, however, an automatic reactor scram occurred due to low reactor vessel water level.

The plant response to the transient was normal. All control rods inserted, the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) Systems initiated, and Groups 2 (Reactor Coolant System), 3 (Reactor Water Clean Up System), and 6 (Primary and Secondary Containment) Isolations occurred. Normal reactor vessel water level was

restored and HPCI, RCIC, and RFP B were subsequently secured.

The malfunction of the RFP master controller was caused by the failure of a normally energized 1/2 watt voltage dropping resistor. The most probable root cause for its failure is age related degradation. The failed master controller was replaced with a spare controller. Prior to its installation, the spare unit was visually inspected for degraded components and bench tested. Additionally, other similar GEMAC controllers in the HPCI, RCIC and Reactor Feedwater Systems were inspected for visual signs of degradation of resistors and other components. No deficiencies were found. Further corrective action to be taken includes an evaluation of GEMAC controllers for age related concerns.

END OF ABSTRACT

A. Event Description

On December 14, 1993, at 1:34 am, with the plant in operation at full power, an automatic reactor scram occurred due to low reactor vessel water level. The cause of the low water level was determined to be a failure of the Reactor Feedwater Pump (RFP) master controller. This initially caused the Reactor Feedwater Pump Turbines (RFPTs) to decrease in speed. RFPT A subsequently entered Lock and Hold when the master controller generated a loss of control signal trip. However, a higher bias setting on
RFPT B prevented it
from receiving the loss of control signal trip and it continued to decrease in speed until it entered Lock and Hold caused by a reactor vessel level transmitter failure (low level) signal. By this time, RFPT B had dropped to near minimum pumping speed and its flow contribution was negligible.

Upon receipt of annunciators associated with the feedwater system, one of the Control Room operators appropriately responded by reducing the speed of the Reactor Recirculation (RR) Pumps. In accordance with procedure, as water level continued to decrease the operator tripped the B RR Pump in an effort to reduce power more rapidly; however, an automatic reactor scram occurred due to low reactor vessel water level.

The plant response to the transient was normal. All control rods inserted and the turbine tripped. High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) initiated, and

Groups 2 (Reactor Coolant System), 3 (Reactor Water Clean Up System), and 6 (Primary and Secondary Containment) Isolations occurred. Normal reactor vessel water level was restored and HPCI, RCIC, and RFP B were subsequently secured.

An Unusual Event was declared at 1:56 am due to the injection of Emergency Core Cooling. Initial notifications were completed at 2:03 am and the Unusual Event was terminated at 4:15 am.

B. Plant Status

The plant was operating at approximately 100 percent power (2378 MWt; 797 MWe).

C. Basis for Report

Unplanned automatic actuation of the engineered safety features including the Reactor Protection system reportable in accordance with 10CFR50.73 (a)(2)(iv).

D. Cause

The malfunction of the Reactor Feedwater Pump master controller was caused by the failure of a voltage dropping resistor which resulted in a second resistor also failing. These are normally energized 1/2 watt carbon resistors. The most probable root cause for the failure is age related degradation. The two resistors were replaced and the controller was bench tested extensively without a recurrent failure. This indicates that an undetected circuit failure or problem was not present. It appears that this failure was an isolated incident since subsequent inspections of several other controllers of similar design did not detect any degradation.

E. Safety Significance

While the Reactor Protection System and a number of Engineered Safety Features were challenged, the associated systems and components performed as designed. The immediate response by Operations personnel to the transient was appropriate, enabling rapid control and stabilization of critical plant parameters.

F. Safety Implications

Other controllers of this vintage may be subject to similar failures

or degradation; however, inspections of several other controllers did not detect any degradation. The consequences of this event at any other power level or in any other operational condition would not have been more significant than the full power condition under which the plant was operating at the time of this event.

G. Corrective Action

The failed master controller was replaced with a spare controller. The spare unit was visually inspected for degraded components and bench tested prior to installation. Further corrective action consisted of replacing the two resistors and bench testing the controller to determine if an undetected circuit problem had caused the resistors to fail. The controller performed satisfactorily.

Other similar GEMAC controllers in the High Pressure Coolant Injection, Reactor Core Isolation Cooling and Reactor Feedwater systems were inspected for visual signs of degradation of resistors and other components. No deficiencies were found.

Further corrective action to be taken includes an evaluation of GEMAC controllers for age related concerns.

H. Similar Events

None.

ATTACHMENT TO 9401260276 PAGE 1 OF 1

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CNSS948017

January 13, 1994

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Dear Sir:

Cooper Nuclear Station Licensee Event Report 93-038, Revision 0, is forwarded as an attachment to this letter.

Sincerely,

R. L. Gardner
Plant Manager

RLG/nc

Attachment

cc: J. L. Milhoan
C. R. Horn
J. M. Meacham
R. E. Wilbur
V. L. Wolstenholm
D. A. Whitman
INPO Records Center
NRC Resident Inspector
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